

HANDBOOK

FOR

Hardwood Lumbermen.

S
25
7

LIBRARY OF CONGRESS.

Chap. *TS 425* Copyright No.

Shelf *52*

UNITED STATES OF AMERICA.

HANDBOOK

— FOR —

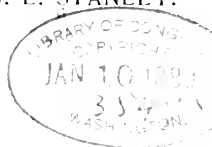
Hardwood Lumbermen,

CONTAINING

RULES FOR INSPECTION.

BY

J. L. STANLEY.



1888 :
BROOKS & COMPANY,
CLEVELAND, O.

2

TS 92.8
-11

Entered according to Act of Congress in the year 1888, by
J. L. STANLEY, in the office of the Librarian of Con-
gress, at Washington.

SELECTING TIMBER.

In selecting timber for special purposes the soil in which it has grown, thrift and age of the trees and exposure to the sun, should be taken into consideration. If the qualities desired are strength and elasticity, young and thrifty trees, which have grown on lowlands or south hill-sides, exposed to the sun, should be selected. For durability, trees which have grown in the forest, on the uplands or north hill-sides and in dark, gravelly or sandy soil, will give the best results. The lower part of a tree is the strongest, most elastic and durable, and the wood near the heart is the best for nearly all purposes.

Timber, selected for durability, should not be felled while the sap is flowing. The nearer maturity, the more durable the wood. Timber, which has passed maturity and is on the decline, is of inferior quality, and, in some kinds, the wood near the bark will be brash, with occasional dotted spots or streaks. White Ash timber, which is on the decline, frequently shows dotted spots soon after maturity, and, if a branch or the bark has been torn off, a streak will some-

times extend quite a distance along the body of the tree.

The condition of timber may be ascertained by the color and the amount of the foliage, by the bark, and by the general appearance of the trees.

FELLING TIMBER.

The time of year for felling timber has heretofore been considered as of little consequence, but the constantly increasing demand for lumber from fall or winter-felled timber must eventually be recognized as an important matter.

The wood from timber felled when the sap is flowing will soon become discolored, if piled without crossings or where the air cannot circulate freely and the gases escape easily. It is more liable to be eaten by worms, will warp more and decay sooner, than wood from timber felled in the fall or early winter.

August and September are, perhaps, the best months, but for all ordinary purposes timber may be felled from the first of August to the middle of February--or until the sap commences to flow.

Large and valuable timber should be felled with the saw, and should be cut near the ground, as the lower part of a tree is the best. A saving of one foot in length of a tree thirty-six inches in diameter, is a saving of from fifty to sixty feet of lumber, board measurement. Saws used for felling, should have one handle bolted

on so that it can be easily taken off and the saw drawn out endways, if desired. One or two iron wedges should be driven in after the saw to prevent its becoming fast.

Leaning trees should be cut so that they will fall at right angles to the direction in which they incline. This can be easily accomplished by first cutting about one fourth through the tree on the side on which it is desired to fell it, and then sawing in on the opposite side and forcing it over with wedges.

Trees, felled with the axe, should be cut deeper at the center than near the bark, to prevent tearing and splitting the wood when falling.

MANUFACTURING LUMBER.

This is a matter of so much importance to the producer that a person cannot successfully manufacture lumber for the market without a fair knowledge of the business. Men of experience are aware that it is the firsts and seconds which make the profit, and that the commons and culls do not sell for much, if anything, more than the expense of manufacturing and marketing, added to the cost of the timber. This being the case, care should be taken in the selection of timber, and good judgment exercised in cutting and sawing the logs and preparing the lumber for market.

When the slab is taken off and a face of six or eight inches is obtained, one inch boards should

be sawed (except in lumber less than two inches in thickness or from large logs) until the log will square, then the square should be sawed into the desired dimensions, making the lumber as wide as a face of the square. The heart pieces should be taken to the edger or log carriage and the heart cut out of all merchantable lumber. Where the heart is large, or defective from rot or shakes, it is sometimes advisable to saw around it, leaving a square in the center. Siding boards, and all other lumber, should be edged, as lumber which has not straight or passably even edges is excluded from the upper grades.

After the lumber has been sawed it should be carefully looked over and pieces with defects, which will furnish a first or second piece from one side, should be taken to the edger and the good piece ripped off, and pieces with defects near the end should be cut off if ten feet will remain.

Lumber should always be sawed one sixteenth of an inch thicker, for each inch in thickness, than the size required when seasoned, as a shortage in thickness will reduce the piece to culls or to the next standard thickness below. Lumber not full in length is reduced to the next standard length below.

QUARTER-SAWING LUMBER.

Logs for quarter-sawing should be of the best quality and not less than 28 inches in diameter.

Manufacturers should remember that this kind of lumber is usually finished in the natural color of the wood, and that worm-holes and discolored spots are very objectionable defects.

Care should be taken to saw the lumber as nearly straight across the grain of the wood as possible. Many plans for quarter-sawing have been tried, but those given below are the ones generally used, and the cutting of each quarter separately is considered the best.

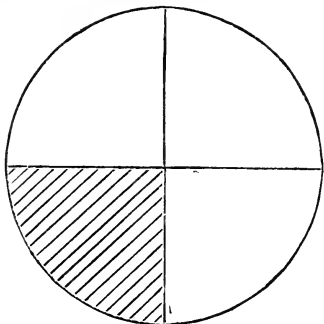


Fig. 1.

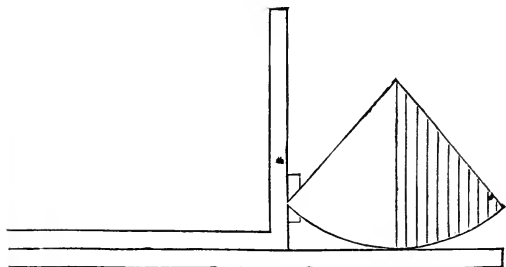


Fig. 2.

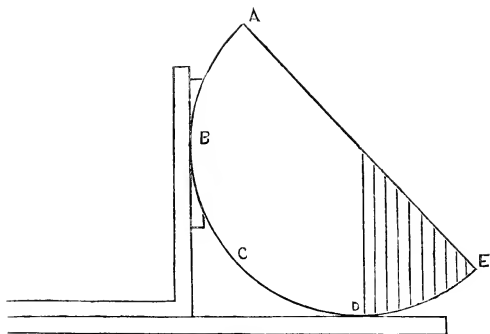


Fig. 3.

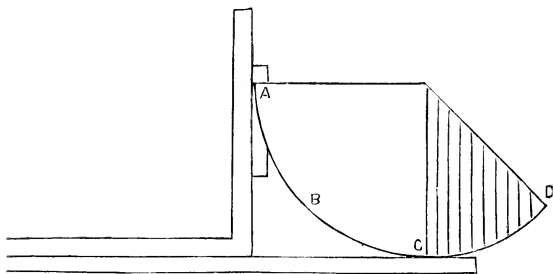


Fig. 4.

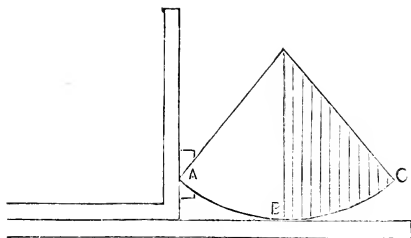


Fig. 5.

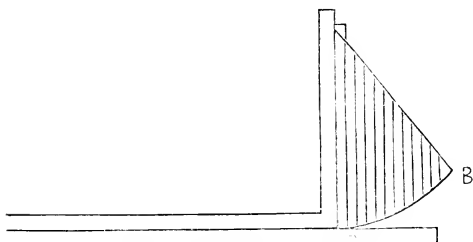


Fig. 6.

Figure 1 represents a log divided into quarters, and shows how the quarters should be sawed.

Figure 2 represents a quarter in position for sawing.

Figure 3 represents one half of a log in position for sawing from e to d; Fig. 4 in position for sawing from d to c; Fig. 5 in position for sawing from c to b, and Fig. 6 in position for sawing from b to a.

SEASONING LUMBER.

Green lumber contains from 25 to 45 per cent. of liquid matter. After one year's seasoning, one inch lumber will contain from 3 to 11 per cent.

The slow process of drying lumber under sheds is the best, because more of the strength and lasting qualities of the wood are retained, but, for many purposes, the quick process of kiln-drying by steam and hot air gives satisfaction, provided the lumber has been on sticks long enough to prevent warping and checking.

When lumber is sawed it should immediately be placed on narrow sticks of even thickness, one stick being directly over another, with the ends projecting a trifle beyond the lumber. A space of one inch between the layers is recommended, except in Oak, Hickory and Ash, which give better results when there is only a small space. Boards should never be used for crossings in piling green lumber, as the wood will stain and decay between the crossings, and the lumber will become uneven in width and thickness. It should be piled with slope enough to carry off the rain, where the air can circulate freely and it will be protected from the sun and warm currents of air during the summer months, as the wood will check if the liquid near the surface evaporates too rapidly.

After the lumber is thoroughly seasoned, it should be taken off the sticks and re-piled or carefully placed under cover, where rain or moisture

from the ground cannot affect it. The alternate changing from a moist to a dry atmosphere, and *vice versa*, hastens the decay of wood. In a perfectly dry atmosphere, or in fresh water, the durability of wood is almost unlimited.

LOADING LUMBER FOR SHIPMENT.

Lumber for shipment by rail should be loaded in box cars, as the sun and rain will damage exposed lumber, while the dust and fragments of charred fuel will cause it to present an unfair appearance. When two or more grades are sold at different prices, and delivered on the same car, each grade should be kept separate. If more than one length is shipped, each length should also be kept separate. Lumber should always be loaded with the ends even at the middle of the car.

Care should be taken to load so that the lumber will present a fair, average appearance, as conclusions are frequently formed from first sight.

ADVANTAGES OF SELLING IN GRADES.

Inexperienced lumbermen are usually prejudiced against the grading system. Experience, however, not only teaches the justice of it, but demonstrates that it is beneficial, and the only business-like way of conducting the lumber trade.

In the first place, the timber is more carefully selected. The logs are made desirable lengths and the lumber is better manufactured. This means

more profit to the manufacturer. When log-run is sold in one grade, at one price, there is not the care that should be taken in sawing and preparing the lumber for market. If firsts and culls bring the same price, persons will not spend the time necessary to manufacture and care for lumber as it should be done. This is certainly a mistake, because, according to the quality and the way the lumber is manufactured and seasoned, the price should be, and usually is, fixed, whether in one or four grades.

Another advantage in grading is, that the lumber is measured full. This obviates the objectionable feature from which so many differences arise—that of deducting for defects.

Finally, in selling by this system, the lumber is graded and measured according to rules, with which all lumbermen may, and should, be familiar. A knowledge of the rules will greatly aid in manufacturing, and will place the manufacturer in a position to know whether or not lumber is inspected correctly.

LOG-RUN LUMBER MEASURED MERCHANTABLE.

The practice of measuring lumber merchantable, or measuring only what will work clear, is one which should not be recognized by the manufacturer, dealer or any person engaged in the lumber business, for the reason that, since no rules can be given for governing the measurement, there can

be no intelligent understanding between the seller and the buyer.

The manufacturer knows, or should know, the quality and condition of his lumber. This being true, it is reasonable to suppose that lumber running well into firsts and seconds, will be sold in grades, and that lumber from inferior logs, poorly manufactured, or not in fair condition, will be offered as log-run measured merchantable. It will be readily seen that, thus far, the selling party has a leading advantage, since the buyer, even if he has seen the timber or piles of lumber, can form an opinion only from the general appearance.

On the other hand, the purchasing party is permitted to be the judge of what portion of a piece will work clear, and, as no definite rules can be given, the inspector decides how much should be deducted for defects. For some purposes a piece might work clear three fourths of its full size, while, for another purpose, it might not work one half clear. This is one cause of the differences in measurement so frequently found. Another reason is that persons often buy what they are led to believe is much better stock than that delivered to them, and, as a last resort, to protect themselves from loss, they subject the lumber to a rigid inspection.

If any person insists on selling or buying log-run lumber in one grade, there should be a guaranty of a certain per cent. of the upper grades, and the measurement should be full.

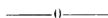
LOGS FOR SHIPMENT.

Large select timber of the higher priced woods can frequently be marketed at a better advantage in logs than in lumber. There is a demand for choice logs of Walnut, Cherry, Oak, etc., for shipment to our home and foreign markets.

Logs for this purpose must be large and of the best quality, free from rot, splits and knots, and twelve, fourteen or sixteen feet long. The diameter should not be less than twenty-four inches in Walnut, twenty inches in Cherry, and twenty-eight inches in Oak and Poplar.

As soon as the logs are cut the ends should be well covered with paint, containing one and one half pounds of salt to the gallon, to prevent checking, and the bark should be taken off and the log hewed to the depth of the sap on four or eight sides.

Logs for shipment are generally sold at the actual measurement—no allowance being made for saw curfs, as in tables reducing logs to board measure.



Red Cedar, White Oak, Walnut and Chestnut, are durable woods in dry places, in fresh water, or when buried in the ground.

The strength of many kinds of lumber, such as White Ash, White Oak and Hickory, is increased by seasoning, but the elasticity is decreased.

Lumber from timber which has been immersed in water will season much sooner and warp less, when placed on sticks, than lumber which has not been water seasoned.

The shrinkage in seasoning Poplar, Basswood, Chestnut, Cottonwood and similar woods, is from one eighteenth to one twenty-fourth, and in Oak Maple, Walnut and Cherry, from one twenty-second to one twenty-eighth.

The breaking strain of different kinds of wood, 2 inches square and 12 inches long, is as follows, viz:

Ironwood.....	15,000 lbs.
Hickory	7,700 "
White Oak.....	6,800 "
Hard Maple.....	5,400 "
White Ash.....	5,300 "
Cedar... ..	3,200 "
Poplar, yellow.....	2,700 "
White Pine.....	2,300 "

RULES

GOVERNING THE

Inspection of Hardwood Lumber.

—0—

WALNUT, CHERRY AND BUTTERNUT.

Standard lengths are 12, 14 and 16 feet. Twenty per cent. of 10 feet, or 12 per cent. of 8 feet, will be admitted.

Standard thicknesses are 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

Special thicknesses are $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 5 and 6 inches.

FIRSTS must be at least 8 inches wide and free from defects, with the following exceptions, viz:—

Ten inches, or over, wide will admit of $\frac{1}{6}$ the width of the piece of bright sap showing only on one side, or a straight split in one end of a board or plank equal in length to the width of the piece.

Sixteen inches, or over, wide will admit of one standard knot showing only on one side.

SECONDS must be at least 6 inches wide and free from defects up to 8 inches in width. Eight inches, or over, wide will admit of a straight split in one end, not exceeding in length twice the width of the piece, or $\frac{1}{2}$ the width of the piece of bright sap showing only on one side, or defects equal to standard knots, as follows: 8, 9, 10 and 11 inches wide, one defect; 12, 13, 14 and 15 inches wide, two defects; 16 inches and over, three defects.

COMMONS must be at least 4 inches wide and free from defects up to 6 inches in width. Six and 7 inches wide will admit of 2 inches of bright sap showing only on one side, or a straight split in one end, not exceeding $\frac{1}{2}$ the length of the piece, or one defect equal to a standard knot. Eight inches, or over, wide will admit of twice as many defects, equal to standard knots, as are admitted in seconds, or a straight split in one end, not exceeding $\frac{1}{2}$ the length of the piece, or $\frac{1}{2}$ the width of the piece of bright sap showing only on one side. Knots of sound character up to 4 inches in diameter will be admitted in this grade, but each inch of the diameter of the knot shall be considered equal to a standard knot.

CULLS must be at least 3 inches wide. One side of each piece must be heart wood, but sap is not limited on the other side. This grade includes lumber of any standard or special thickness and of any even length, 6 to 16 feet inclusive. It includes all lumber less than 1 inch

thick, unless marketed as a special thickness, and lumber varying in thickness more than $\frac{1}{4}$ of an inch. It also includes lumber containing shakes, hearts, stain or unsound knots, and all lumber below commons which will work $\frac{1}{2}$ clear.

QUARTER-SAWED OAK AND SYCAMORE.

Standards lengths are 12, 14 and 16 feet; $12\frac{1}{2}$ per cent. of 10 feet will be admitted.

Standard thicknesses are 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

FIRSTS must be at least 6 inches wide and free from defects, with the following exceptions, viz :

A straight split in one end of a board or plank, not exceeding in length the width of the piece, or a defect equal to a standard knot, showing only on one side, in lumber 12 inches, or over, wide.

SECONDS must be at least 5 inches wide. Five inches wide must be clear. Six and 7 inches wide will admit of one small defect ; 8, 9 and 10 inches wide will admit of one defect equal to a standard knot ; 11, 12 and 13 inches wide will admit of two defects equal to standard knots ; 14 inches, or over, wide will admit of three defects equal to standard knots. A straight split in one end of a board or plank, equal in length to twice the width of the piece, will be admitted in this grade if free from other defects.

COMMONS must be at least 4 inches wide. Four inches wide must be clear ; 6 and 7 inches wide

will admit of one defect equal to a standard knot ; 8 inches wide, and over, will admit of twice as many defects, equal to standard knots, as are admitted in seconds, or one or more larger knots according to the width of the piece, or a straight split in one end of a board or plank not exceeding one half the length of the piece.

CULLS must be at least 3 inches wide. 3 inches wide must be clear ; 4 inches wide may contain one defect equal to a standard knot ; 5 inches wide, or over, includes lumber below commons, which will work at least one half clear.

POPLAR (or WHITEWOOD.)

Standard lengths are 12, 14 and 16 feet ; $12\frac{1}{2}$ per cent. of 10 feet will be admitted.

Standard thicknesses are 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

Special thicknesses include $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 5 and 6 inches.

FIRSTS must be at least 10 inches wide and free from defects, with the following exceptions, viz :

Lumber 12 inches, or over, wide will admit of a straight split in one end not exceeding in length the width of the piece, or $\frac{1}{6}$ the width of the piece of bright sap showing only on one side ; 16 inches, or over, wide will admit of one defect equal to a standard knot showing only on one side.

SECONDS must be at least 8 inches wide. 8 and 9 inches wide must be free from defects ; 10, 11 and 12 inches wide may contain one defect equal to a

standard knot; 13, 14 and 15 inches wide may contain two defects equal to standard knots, and 16 inches, or over, wide may contain three such defects. A split in one end, not exceeding in length twice the width of the piece, or one fourth the width of the piece of bright sap showing only on one side, will be admitted in this grade, if free from other defects.

COMMONS must be at least 6 inches wide. 6 and 7 inches wide must be free from defects; 8 and 9 inches wide may contain one defect equal to a standard knot, and 10 inches, or over, wide will admit of twice the number of defects equal to standard knots that are admitted in seconds.

A straight split in one end one half the length of the piece will be admitted. Bright sap is not limited in this grade.

CULLS same as Walnut, except that sap is not limited.

OAK, ASH, MAPLE, HICKORY AND CHESTNUT.

Standard thicknesses are 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

Special thicknesses include $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 5 and 6 inches.

Standard lengths are 12, 14 and 16 feet; $12\frac{1}{2}$ per cent. of 10 feet will be admitted.

FIRSTS must not be less than 8 inches wide and free from defects, with the following exceptions, viz: A straight split in one end of a board or

plank, equal in length to the width of the piece, will be admitted, or lumber 15 inches, or over, wide may contain one defect equal to a standard knot showing only on one side.

SECONDS, 1 and $1\frac{1}{4}$ inches thick, must be at least 6 inches wide and free from defects up to 8 inches in width; $1\frac{1}{2}$ inches thick, or over, must be at least 8 inches wide.

Hearts, shakes and rot are excluded from this grade. Lumber 8, 9, 10 or 11 inches wide may contain one defect equal to a standard knot; 12, 13, 14 or 15 inches wide may contain two defects equal to standard knots; 16 inches wide, or over, may contain three defects equal to standard knots. If free from other defects, a piece may contain a straight split in one end not exceeding in length twice the width of the piece.

COMMONS must be at least 4 inches wide and free from hearts and rot. 4 and 5 inches wide must be clear; 6 and 7 inches wide may contain one defect equal to a standard knot; 8 inches wide, or over, may contain twice the defects admitted in seconds, or may contain knots up to 4 inches in diameter, but each inch of the diameter of the knot must be counted as equal to a standard knot defect. Lumber 8 inches wide or over may contain a straight split in one end one half the length of the piece, or straight splits in each end, together not exceeding one third the length of the piece.

CULLS must be at least 3 inches wide and of any even length, 6 to 16 feet inclusive. Three inches wide must be clear, but 4 and 5 inches wide may contain one defect equal to a standard knot. Six inches wide, or over, includes all lumber below commons which will work one half clear. This grade includes lumber of any standard or special thickness. It also includes lumber less than 1 inch thick, unless marketed as special stock, and lumber varying in thickness more than $\frac{1}{4}$ of an inch.

BASSWOOD, COTTONWOOD, SYCAMORE, ELM, BIRCH, BEECH AND GUM.

Standard lengths are 12, 14 and 16 feet. $12\frac{1}{2}$ per cent. of 10 feet is admitted.

Standard thicknesses are 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

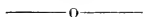
FIRSTS must be at least 8 inches wide.

SECONDS must be at least 6 inches wide.

COMMONS must be at least 4 inches wide.

CULLS must be at least 3 inches wide.

Inspection, otherwise, same as Oak.



FLOORING lumber must have one side and both edges clear, and be at least 3 inches wide and 12, 14 or 16 feet long.

SIDING lumber must be 6 inches wide or a multiple thereof, and 12, 14 or 16 feet long. Firsts must be free from defects; seconds may contain 2

inches of bright sap, showing only on one side, or one defect equal to a standard knot.

COUNTER TOPS must be at least 20 inches wide, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ or 2 inches thick and 12, 14 or 16 feet long, and must be practically free from defects.

BALUSTERS must be $1\frac{1}{2}\times 1\frac{1}{2}$, 2×2 , $2\frac{1}{2}\times 2\frac{1}{2}$, 3×3 or 4×4 , 28 or 32 inches long, and practically free from defects.

NEWELS must be 5×5 , 6×6 , 7×7 , 8×8 , 10×10 or 12×12 , 4 feet long or a multiple thereof, and practically free from defects.

COLUMNS must be 5×5 , 6×6 , 7×7 , 8×8 or 10×10 , 10, 12, 14 or 16 feet long, and practically free from defects.

Lumber for special purposes, such as wagon poles, axles, harrow stock, &c., must be practically clear. In such stock no grade is made between firsts and culls.

A combined grade of firsts and seconds must contain at least 50 per cent. of firsts, and a combined grade of commons and culls must contain at least 40 per cent. of commons.

Lumber below or over the standard lengths, or not of standard thicknesses, must be marketed as special stock.

Lumber one inch or less in thickness shall be counted at face measurement.

In the measurement of boards or planks, fractions of less than $\frac{3}{4}$ of an inch in the width will not be counted except in dimension lumber. $\frac{3}{4}$ of a foot or over will be counted as one foot, unless the lum-

ber runs largely into such fractions, in which case the fraction will be counted on alternate pieces.

All edged lumber shall be measured full, and lumber not edged shall be measured inside of the bark or wane.

Seasoned lumber must be full in thickness, and green lumber must be $\frac{1}{16}$ of an inch thicker for each inch in thickness than the size required when dry.

All boards and planks should have straight ends and edges. Lumber not passably edged shall be reduced one grade.

A standard knot must be of sound character and not exceed $1\frac{1}{2}$ inches in diameter.

Tapering lumber shall be measured $\frac{1}{3}$ of the distance from the narrow end.

The grade of all boards and planks shall be determined from the poorer side.

Lumber stained or season checked so that an even surface of the natural color of the wood can not be obtained by surfacing, must not be classed above culls.

Lumber which will not work one half clear is mill culls and has no market value.

The face measurement of each piece should be tallied separately, and the footings of lumber over 1 inch should be multiplied by the thickness.

GENERAL REMARKS.

A person with little experience in the lumber business, may acquire a fair knowledge of grad-

ing and measurement by studying the rules for inspection, but, without considerable experience, he cannot become a competent inspector. Neither is a person, who has learned the grading of only one kind of lumber, qualified to inspect all the varieties classed as hardwoods.

Rules for inspection may be specific on measurement and may clearly outline the grades, but they cannot give the details and location of the innumerable defects. It must be left to the inspector to decide what defects are equal to a standard knot, and to determine the damage caused by stain, checks, etc.

The grades of firsts, seconds, commons and culls apply to boards and planks of all kinds of hardwood. Firsts should be practically free from defects. Seconds should work about $\frac{5}{8}$ clear, commons about $\frac{2}{3}$ clear, and culls at least $\frac{1}{2}$ clear. If a second 8 or 9 inches wide will admit of one standard knot, a second 10 or 11 inches wide should admit of a small additional defect, but in no case should the additional defect equal a standard knot. This rule should be applied to all widths and to all grades.

The waste caused by knots from 1 to 4 inches in diameter is estimated as one square foot of the thickness of the piece for each inch of the diameter of the knot. Small knots, worm-holes, gum and other dark, discolored spots, must be treated as defects. Many kinds of hardwood are finished in the natural color of the wood and

such defects must necessarily cause a waste, and, as inspectors are not supposed to know for what purpose lumber is intended, the only safe rule is to treat them as damaging defects in whatever kind of lumber they may be found.

A board or plank with a straight check in each end may be admitted in the second grade if the combined length of the checks does not exceed the width of the piece, or may be admitted in the common grade if their combined length does not exceed one third the length of the piece.

The grades are determined by the damage caused by defects, but no deductions are made from the full measurement inside of the bark or wane. Deductions from the width or length of a piece, for the purpose of raising the grade, are not allowed, unless the inspector is so instructed by the selling and purchasing parties. In short, no variation from the rules should be made unless agreed upon by the contracting parties.

WEIGHTS OF LUMBER.

The following weights have nearly all been obtained from the average weights of car-load lots, and may be relied upon as being nearly correct. The figures are the pounds per 1,000 feet, board measure:

	GREEN.	DRY.
Walnut.....	5,600	3,800
Cherry.....	5,200	3,700
White Oak.....	5,700	3,800
Hard Maple.....	5,200	3,900
White Ash.....	5,200	3,500
Chestnut.....	5,400	3,000
Sycamore.....	5,200	3,800

	GREEN.	DRY.
Hickory	5,600	4,200
Beech.....	5,100	3,900
Elm.....	5,100	3,600
Butternut.	4,200	2,300
Yellow Poplar.....	4,000	2,400
Basswood.....	3,900	2,200
Cottonwood.....	4,000	2,300

COLUMNS.

Table giving the feet, board measure.

SIZE.	10 feet.	12 feet.	14 feet.	16 feet.
4 × 4.....	13½	16	18⅔	21⅓
5 × 5.....	20¾	25	29	33⅓
6 × 6.....	30	36	42	48
7 × 7.....	40¾	49	57	65⅓
8 × 8.....	53⅓	64	74⅔	85⅓
10 × 10.....	83⅓	100	116⅔	133⅓

BALUSTERS.

Table giving the inches, board measure.

SIZE.	LENGTH.	
	28 in.	32 in.
1½ × 1½.....	5¼	6
2 × 2	9⅓	10⅔
2½ × 2½.....	14½	16½
3 × 3	21	24
4 × 4	37⅓	42⅔

NEWELS.

Table giving the feet, board measure.

5 · 5.....	4 feet long.	8 $\frac{1}{3}$
6 · 6.....	4 feet long.	12
7 · 7.....	4 feet long.	16 $\frac{1}{3}$
8 · 8.....	4 feet long.	21 $\frac{1}{3}$
10 · 10.....	4 feet long.	33 $\frac{1}{3}$
12 · 12.	4 feet long.	48

LOGS REDUCED TO BOARD MEASUREMENT.

The following table gives the number of feet of 1-inch boards produced from logs from 8 to 30 feet in length and from 12 to 36 inches in diameter. It is obtained by the following rule :

Subtract 4 from the diameter of the log; multiply the remainder by one half of itself; multiply the product by the length of the log and divide the result by 8.

EXAMPLE:—

Log 36 inches in diameter, 12 feet long:		
Diameter of log.....	—4—	32
Multiplied by one-half of itself.....	—	512
Multiplied by the length.....	—	6,144
Divided by 8.....	—	768

LNG FT.	D. 12	D. 13	D. 14	D. 15	D. 16	D. 17	D. 18	D. 19	D. 20	D. 21	D. 22	D. 23	D. 24
8	32	41	50	61	72	85	98	113	128	145	162	181	200
9	36	46	56	68	81	95	110	127	144	163	182	203	225
10	40	51	63	76	90	106	123	140	160	181	203	226	250
11	44	56	69	83	99	116	135	155	176	199	223	248	275
12	48	61	75	91	108	127	147	169	192	217	243	271	300
13	52	66	81	98	117	137	159	183	208	235	263	293	325
14	56	71	88	106	126	148	172	197	224	253	284	316	350
15	60	76	94	113	135	158	184	211	240	271	304	338	375
16	64	81	100	121	144	169	196	225	256	289	324	361	400
17	68	86	106	129	153	180	208	239	272	307	344	384	425
18	72	91	112	136	162	190	221	253	288	325	365	406	450
19	76	96	119	144	171	201	233	267	304	343	385	429	475
20	80	101	125	151	180	211	245	281	320	361	405	451	500
21	84	106	131	159	189	222	257	295	336	379	425	474	525
22	88	111	138	166	198	232	270	309	352	397	446	496	550
23	92	116	144	174	207	243	282	323	368	415	466	519	575
24	96	122	150	182	216	254	294	338	384	434	486	542	600
25	100	127	156	189	225	264	306	352	400	452	506	564	625
26	104	132	163	197	234	275	319	366	416	470	527	587	650
27	108	137	169	204	243	285	331	380	432	488	547	609	675
28	112	142	175	212	252	296	343	394	448	506	567	632	700
29	116	147	181	219	261	306	355	408	464	524	587	654	725
30	120	152	188	227	270	317	368	422	480	542	608	677	750

LNG FT.	D. 25	D. 26	D. 27	D. 28	D. 29	D. 30	D. 31	D. 32	D. 33	D. 34	D. 35	D. 36
8	221	242	265	288	313	338	365	392	421	450	481	512
9	248	272	298	324	352	380	410	441	473	506	541	576
10	275	302	331	360	391	423	456	490	526	563	601	640
11	303	333	364	396	430	465	501	539	578	619	661	704
12	330	363	397	432	469	507	547	588	631	675	721	768
13	358	393	430	468	508	549	592	637	683	731	781	832
14	386	424	463	504	547	592	638	686	736	788	841	896
15	413	454	496	540	586	634	683	735	788	844	901	960
16	441	484	529	576	625	676	729	784	841	900	961	1024
17	468	514	562	612	664	718	775	833	894	956	1021	1088
18	496	545	595	648	703	761	820	882	946	1012	1081	1152
19	524	575	628	684	742	803	866	931	999	1069	1141	1216
20	551	605	661	720	781	845	911	980	1051	1125	1201	1280
21	579	635	694	756	820	887	957	1029	1104	1181	1261	1344
22	606	666	727	792	859	930	1002	1078	1156	1238	1321	1408
23	634	696	760	828	898	972	1048	1127	1209	1294	1381	1472
24	662	726	794	864	938	1014	1094	1176	1262	1350	1441	1536
25	689	756	827	900	977	1056	1139	1225	1314	1406	1501	1600
26	717	787	860	936	1016	1099	1185	1274	1367	1463	1562	1664
27	744	817	893	972	1055	1141	1230	1323	1419	1519	1622	1728
28	772	847	926	1008	1094	1183	1276	1372	1472	1575	1682	1792
29	799	877	959	1044	1133	1225	1321	1421	1524	1631	1742	1856
30	827	908	992	1080	1172	1268	1367	1470	1577	1688	1802	1920



LIBRARY OF CONGRESS



0 017 111 034 8